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UNITED STATES DEPARTMENT OF AGRICULTURE,
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INJURIES TO CATTLE FROM SWALLOWING POINTED OBJECTS.

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That cattle are very prone to swallow indigestible substances, many of them injurious and even fatal, has been known to veterinarians for a long time. It is, however, regarded by many of them as of rare occurrence, a casualty worthy of note more as a curiosity than as something demanding constant attention.

Autopsies on tuberculous cattle made during the past four years have shown clearly that injuries inflicted by pointed metallic bodies are of frequent occurrence, and therefore of decided economic importance.

Information gained from the above-mentioned examinations causes us to believe that this evil may, to some extent, be prevented. It was noticed that while in certain herds nearly all animals examined were free from injuries due to foreign bodies, in others nearly everyone was injured. On investigation it was ascertained that this difference was due to the fact that one herd had access to miscellaneous objects on pastures and the other had not. Before giving any illustrations of these statements, let us see what injuries are caused by foreign bodies.

Among the most frequent post-mortem indications of the presence of some foreign body are evidences of an inflammatory process about the second stomach (reticulum, or honeycomb) by which it becomes fastened, either to the liver or to the diaphragm, or to both. In the new tissue formed by this inflammatory process are one or more round abscesses, or tumors, which when cut open discharge a foul smelling pus. In some of the herds examined scarcely an animal was free from this inflammatory condition. The binding down of the free (ventral) end of the liver by inflammation is equally frequent and accompanied by a degeneration of some of the liver tissue. Again, the course of the foreign body is invariably toward the lungs and the heart. It punctures the liver or the diaphragm and penetrates a lobe of the lungs or the heart. When it enters the lungs a pneumonia is usually started which extends over the greater part of the affected lobes. In some instances an abscess forms, and this may break into an air tube and the contents be discharged externally.

* Reprint of pp. 78-81 of Tenth and Eleventh Annual Reports of the Bureau of Animal Industry.

The most unfortunate and usually fatal injury is the penetration of the heart by the pointed body. Death may come speedily or slowly after a wasting disease, according to the nature of the injury to the heart. In the cases which we have seen, the injury usually resulted in an inflammation of the pericardial sac, followed by suppuration. The pericardium becomes enormously distended with fluid and pus. This exudate compresses the heart to such an extent that its action becomes very feeble and death results from general dropsy.

Another disease which has been lately observed by us in dairy cattle, as a result of injury to the second stomach by foreign bodies, is abscess in the liver. Sometimes there were as many as five or six of these abscesses, each at least as large as a hen's egg and filled with foul pus.

The literature on this subject is meager, most authors dismissing it with a few sentences. Thus Chauveau says :

It may be noted that the foreign bodies so frequently swallowed by ruminants are usually lodged in the reticulum (second stomach). Therefore it is that at the bottom of the cells are found either small stones and needles or pins, often fixed in the intermediate septa, or nails, scraps of iron, etc.

Most writers deal only with the graver kinds of disease due to foreign bodies, such as those which affect the heart, because only fatal cases have come to their notice. Williams says :

In ruminants, particularly cattle, foreign bodies often find their way into the pericardium (heart case), wounding both it and the heart. While the "carditis" (inflammation of the heart) so induced is circumscribed and merely surrounds the point of puncture, the pericardial inflammation and exudation involve the whole surfaces of the membrane. Cattle are exceedingly fond of chewing and swallowing all sorts of substances. For example, nothing seems to give greater pleasure to a cow than to have an old boot or other piece of leather in its mouth, and this it will chew at with evident gratification. An old brush is also a dainty morsel, and I have seen as a consequence of this that the pericardium has been pricked by the brush nail. Many kinds of sharp-pointed materials have been found in the pericardium of cows. I have seen hairpins, horsenails, and needles. Some writers suppose that needles frequently pass from the esophagus to the heart. Such an occurrence is quite possible, but my own experience, and that of other veterinarians in this country, points to the conclusion that the foreign body finds its way to the heart from the second stomach (reticulum), first of all piercing the wall of that viscus (organ) and the diaphragm, and being gradually drawn by the suction action of the heart into the pericardial sac, generally wounding some portion, commonly the apex of the heart itself. At present I need only state that in cases where a foreign body has been found inducing pericarditis (inflammation around the heart) its course from the second stomach through the diaphragm and mediastinum into the pericardium can be demonstrated post-mortem by the presence of a canal or opening, surrounded by walls of lymph, extending from the stomach to the heart, the foreign body itself lying in the canal, generally more or less eroded or worm-eaten by the action of the juices by which it is surrounded. Sometimes, however, the foreign body, particularly if a substance, such as a needle, which soon rusts, is worn down to a mere fragment, or in some instances, has entirely disappeared by chemical decomposition. In other instances it has been found in the cavities of the heart itself.

Steel, in his Diseases of the Ox, mentions traumatic heart disease as a rather frequent occurrence. He finds hairpins, knitting needles, and nails as a cause. Gamgee described as the cause of a fatal case of traumatic heart disease a "pomegranate prickle" a little over an inch long and as thick as a writing quill, which after death was found lodged in one of the cavities of the heart.

Although cattle swallow a great variety of objects, it is the pointed, slender, metallic ones, such as pieces of wire, hairpins, etc., which do most harm.*

M. Boizy states that the presence of a foreign body when it is the cause of pericarditis many be diagnosed with great certainty. Certain symptoms are common to both simple and traumatic pericarditis, the latter being the form usually caused by foreign bodies. In both forms the pulse is feeble. There is venous pulsation, and œdema (dropsy) of the dewlap.

The only certain differential symptoms are the peculiar character of the heart sounds and the eructation of gas.

In the simple form the gurgling sound is heard with extreme difficulty.

In the traumatic form it is easily heard, and has a rushing, gurgling character, resembling the sound produced by the plunging of butter in a churn. If the noise be feeble increased exercise will increase it, making it plainly audible.

Simple pericarditis is comparatively rare. In it there is no marked eructation of gas.

To show the differences in the post-mortem appearances in herds which are on pastures favorable to the production of the injuries under discussion and those herds which are not subjected to such influences, the following may be used as good illustrations:

HERD A.

Belongs to a large school for girls on the outskirts of a city. The cow pasture was used as a playground. Of 13 head of cattle killed on account of being affected with tuberculosis, all had lesions referable to the swallowing of pointed bodies. This is shown in the following summary in which the word "adhesion" means an inflammatory process which resulted in the binding together of the liver, second stomach, and diaphragm:

ADHESIONS.

No. 1. Abscess between liver and diaphragm. Extensive adhesion of lungs to chest wall of pericardium.

No. 2. Extensive adhesions only.

No. 3. Extensive adhesions with two abscesses containing a piece of wire and a hairpin.

No. 4. Slight adhesions only.

No. 5. Slight adhesions only.

No. 6. Extensive adhesions; also adhesions of lungs.

No. 7. Slight adhesions; also adhesions of lungs.

No. 8. Extensive adhesions. Large abscess attached to lungs contained a hairpin. Adhesion of pericardium to heart.

No. 9. Adhesion of lungs to each other and to chest wall.

No. 10. Extensive adhesions with abscesses; also adhesions in chest.

No. 11. Moderate adhesions with abscesses.

No. 12. Extensive adhesions with abscesses. One abscess contained hairpin.

No. 13. Extensive adhesions. Abscesses in liver.

*It is a common practice among the maw cleaners at the stock yards in Chicago to collect as curiosities all foreign bodies which are found in the stomachs. Mr. J. B. Sine, an employee of the Bureau of Animal Industry at Chicago, made a collection of articles which were said to have been taken from the stomachs of cattle slaughtered for beef, and loaned them to the Bureau as an exhibit for the Columbian Exposition. The following is a partial list of the articles exhibited: A large jack-knife, a silver watch chain, a silver dollar, several smaller coins, numerous metal hairpins, buttons, suspender buckles, Masonic emblem, several pieces of scrap iron, some flat and others round and bent, several very large nails and many of the smaller sizes.

HERD B.

Belongs to a large school for boys. Pasture large, not used for any other purpose. Of 28 animals killed on account of being affected with tuberculosis only one had adhesions about the second stomach.

It should be noticed that the diseased condition caused by the penetrating wires (chiefly hairpins in Herd A), was responsible also for quite extensive inflammation about the heart and lungs (pleuritis and pericarditis).

Other herds in the suburbs of a large city which were pastured on unfenced ground were found affected more or less like Herd A. Thus in one herd, of 10 head killed 4 were found affected with adhesions more or less extensive. Three of these also had abscesses.

In another herd, 4 were killed and 3 found affected. Of the latter 1 had abscesses in the liver, another a foul-smelling abscess in the lungs. In a third herd, 4 out of 11 showed the effects of having swallowed pointed bodies.

It might be claimed that in many of these cases permanent injury to the health of the affected cattle or to their productiveness could not result from the conditions noted above; but a second thought will convince any impartial reader that such a claim is quite erroneous. The severe inflammatory action resulting in the formation of abscesses about the second stomach, the binding of the liver and the second stomach to the diaphragm, the presence of foul abscesses in the liver and in the lungs, and the adhesions of the lungs must surely more or less reduce the vitality of the affected animal. More than this, the offending body often penetrates the heart wall itself, resulting in a hemorrhage which in many cases proves rapidly fatal.

A compilation of the number of cattle which have succumbed to traumatic disease due to the presence of foreign bodies would probably show a high mortality. Such cases have not infrequently come to our notice. The losses due to it throughout the whole country would, if they could be accurately calculated, make the subject appear worthy of close attention on the part of cattle owners. Many animals die suddenly and without apparent cause, and if all such were examined the cause of death in a large percentage of cases would probably be traced to the swallowing of pointed objects.

The frequency of certain traumatic diseases in cattle is thus due to the carelessness of the owners or the attendants of cattle. The milk-maid drops pins and hairpins, the workmen lose or throw away nails, and in removing wire from baled hay are indifferent as to what becomes of the small, broken pieces. The increased use of wire in the construction of fences, and for telegraph and telephone lines, etc., leads to the scattering of small pieces along roads and on pastures.

Cows should not have access to rubbish heaps or to sweepings from buildings, for in these the dangerous objects lie concealed. Care should be taken that all pieces of wire are promptly placed beyond the reach of cattle. Throwing such things upon fenced or unfenced pastures should be studiously avoided. This is a disease without any promise of a cure, but is one for which even the least intelligent can practice daily prevention without any material expenditure or extra labor.